

**FUTURE FISHERIES IMPROVEMENT PROGRAM
GRANT APPLICATION**

(please fill in the highlighted areas)

I. APPLICANT INFORMATION

- A. Applicant Name: Trout Unlimited
- B. Mailing Address: 111 N. Higgins St, Suite 500
- C. City: Missoula State: MT Zip: 59802
- Telephone: 406-543-1192
- D. Contact Person: Rob Roberts
- Address if different from Applicant:
- City: State: Zip:
- Telephone:
- E. Landowner and/or Lessee Name
(if other than Applicant): Lolo National Forest, Ninemile Ranger District
- Mailing Address: 20325 Remount Road
- City: Huson State: MT Zip: 59846
- Telephone: 406-626-5201

II. PROJECT INFORMATION*

- A. Project Name: Twin Creek Mine Reclamation Project
- River, stream, or lake: Twin Creek, Ninemile Creek Watershed
- Location: Township 17N Range 24W Section
- County: Missoula
- B. Purpose of Project:
Improve channel morphology and stream and floodplain function through removal of mine tailings and channel reconstruction. Restore fish passage and connection with main-stem Ninemile creek.
- C. Brief Project Description:

Twin Creek is a second order tributary to Ninemile Creek and is located approximately 17 miles upstream from Ninemile Creek's confluence with the Clark Fork River. The watershed area is about 1.2 square miles, and contains approximately 4 miles of stream channel. The upper watershed has steep valley side-slopes and is forested, with Douglas fir, Western red cedar, alder, willow, and red osier dogwood. The total relief of the Twin Creek basin is about 2,300 feet.

At the lower end, Twin Creek enters a historical mining area and immediately turns 90 degrees to the right where it flows into a series of manmade ditches paralleling a 25' deep, 40' wide dredge pond containing water about 15' wide (see attached Twin Creek Photos). The creek/ditch is on a bench about 14' from the edge of the dredge pond and is generally wide and shallow. Channel substrate is mostly fine gravel and silt with few cobbles. After about 200' the creek turns left and cascades down a steep bank and into the dredge pond. Twin creek water then flows through a series of dredge ponds and appears to go subsurface before reaching Ninemile Creek (see Drawing 1: Conceptual Site Plan).

In 2009, Trout Unlimited began working with the Lolo National Forest and Missoula County to collect baseline data on Twin Creek and begin a conceptual plan for the Twin Creek Mine Reclamation Project. Project partners developed a goal to restore stream channel function to Twin Creek as part of a larger effort to improve overall watershed health in the Ninemile Creek watershed. The project team hired Morrison Maierle, Inc to perform a review of available data, watershed level reconnaissance, targeted field investigations including topographic surveys, sediment sampling, and flow measurements.

The project design will be based on the successful Mattie V Creek Mine Reclamation Project completed in 2011. Mattie V Creek is a similar sized watershed, has similar background watershed conditions and was also dramatically altered by historical mining impacts. During the Mattie V Creek project, TU and partners reconnected Mattie Creek to mainstem Ninemile Creek by moving approximately 12,000 cubic yards of dredge mining tailings and fully reconstructing 450 feet of Mattie Creek in its pre-disturbance alignment. The new Mattie V Creek is in a 7-9% step-pool channel that has perennial flow, complex fish habitat and is rapidly revegetating following construction (see attached Mattie V Creek Photos)

As part of the Twin Creek Mine Reclamation project, TU and partners will move 10,000 cubic yards of dredge mining tailings (see Drawing 2: Grading Plan). The construction area will be cleared, grubbed, and stripped of trees, roots, and other foreign material. Trees and stumps will be removed and stockpiled for use during channel construction and revegetation. All topsoil from disturbed areas in the project boundary will be stripped and stockpiled onsite for use during final grading and subsequent re-vegetation phases of the project. The designated stockpiled storage area is based on the area required to store about 1,500 cubic yards of topsoil. Following stripping and stockpiling of topsoil, major excavation and moving of the tailing material can take place. Material from the dredge mining tailings will be moved into the existing dredge pond and regraded against the surrounding hillslopes. Material moved from the tailing piles to fill areas will be compacted as the lift thickness reaches one foot by continuously driving construction equipment over the newly placed material.

Following earthworks activity, approximately 625 feet of stream channel will be reconstructed. New channel slopes will range from 3.6% to 6.5% (See Drawing 3: Creek Plan and Profile). Suitable large rock for instream grade control will be identified and segregated during excavation of the tailing piles and stored on-site for use during channel construction. Boulders and large cobble will also be hauled to site as needed. Based on the estimated project length and channel slopes, approximately 40 step-pool structures will be required for the project and will be constructed using large clast boulders and log structures, with a footer depth of 2 feet. Randomly placed boulders and large rock in the tread between steps will create heterogeneity and habitat. Based on reference surveys and hydraulic analyses, the stream channel will have a bankfull width of 7 feet and a bankfull depth of 1 foot. The floodplain will be created 20 feet on either side of the channel with 10:1 slopes (see Drawing 4: Channel Detail). Streambanks will be stabilized by creating a coarse cobble toe below baseflow elevation and installing vegetated soil lifts to bankfull dimensions. Soil lifts will consist of sorted topsoil wrapped in biodegradable erosion fabric. Willow cuttings will be placed in the soil lift at approximately 2 cuttings per foot and backfilled with topsoil. Coir logs will be randomly interspersed in the soil lifts to provide moisture retention and growing medium for cutting and container stock. Container plants (5 gallon) will be planted at 5 foot spacing (see Streambank Stabilization Typical).

The site will be seeded post construction with a native dryland grass mix and covered with sterile straw mulch. Timber slash and forest duff will be applied to areas (e.g. spoil piles) that lack topsoil to facilitate germination and growth.

The total project budget for the project on Twin Creek is \$159,950. Of this total, Trout Unlimited is requesting \$41,000 or 25% from the Future Fisheries Grant Program. Other grant funds include \$92,850 from Missoula County through the DNRC Reclamation and Development Grant Program, \$10,000 from the Lolo National Forest and \$16,100 in in-kind services from Trout Unlimited and the Lolo National Forest. TU has an existing partnership agreement with the Lolo National Forest that provides the legal mechanism for the next steps in the project, including permitting, money transfer and on the ground construction. TU will serve as the lead on the project, with additional oversight provided by Lolo National Forest staff and Morrison Maierle Inc. Reclamation work will begin in July 2012 and is projected to take approximately 6 weeks for completion.

D. Length of stream or size of lake that will be treated: 625 feet

E. Project Budget:

Grant Request (Dollars): \$ 41,000

Contribution by Applicant (Dollars): \$ In-kind \$ 7,100
(salaries of government employees are not considered as matching contributions)

Contribution from other Sources (Dollars): \$ 102,850 (cash) In-kind \$ 9,000
(attach verification - See page 2 budget template)

Total Project Cost: \$ 159,950

F. Attach itemized (line item) budget – see template

G. Attach specific project plans, detailed sketches, plan views, photographs, maps, evidence of landowner consent, evidence of public support, and/or other information necessary to evaluate the merits of the project. If project involves water leasing or water salvage complete supplemental questionnaire (fwp.mt.gov/habitat/futurefisheries/supplement2.doc).

H. Attach land management and maintenance plans that will ensure protection of the reclaimed area.

III. PROJECT BENEFITS*

A. What species of fish will benefit from this project?:

Twin Creek and upper Ninemile Creek host a mixed assemblage of native westslope cutthroat and wild brown trout and brook trout.

B. How will the project protect or enhance wild fish habitat?:

Baseline data collection efforts on Twin Creek show a lack of pools, large woody debris and complex habitat in the lower end, as compared with the upper reaches which are still functioning at a high level. Results on Twin Creek should closely mirror results from the Mattie V Creek project, where pre-project measurements showed an average of 5 pools per 100m in the impaired reach and 25 pools per 100m in the channel post-restoration. Pre and post macroinvertebrate sampling on Mattie V Creek also showed a marked difference in the diversity and density of macroinvertebrates in the newly constructed reach. Within the realigned reach on Twin Creek, step-pool features will create hydraulic complexity and velocity refugia for aquatic organisms, including low-velocity pool habitat. Step-pool features will dissipate energy and reduce the amount of total shear stress applied to the channel bed, which will create more stable benthic and interstitial habitat.

C. Will the project improve fish populations and/or fishing? To what extent?:

Pre-restoration fish sampling on the Mattie V Creek project showed an average of 8 fish per 100m in the impaired reach. Fish were predominantly brook trout. Post-restoration fish sampling in the newly constructed reach showed 35 fish per 100m with a mix of westslope cutthroat and brook trout. Reconstructing Twin Creek to follow its historic channel alignment and recreating a steeper step-pool channel with large woody debris will partially eliminate the favorable conditions for brook trout and should favor high densities of fish and favor westslope cutthroat. While brook trout are the dominant assemblage component in many Ninemile Creek tributaries, cutthroat trout are found higher in the watersheds and there is a fluvial life history form of cutthroat in Ninemile Creek. The project team believes that the degraded habitat at and below these mine sites is partially responsible for the low densities of fish and presence of non-native fish. Further sampling on Mattie V Creek and other projects will continue to shed light on this issue.

D. Will the project increase public fishing opportunity for wild fish and, if so, how?:

Twin Creek is currently diverted into a man made ditch and subs out in dredge mining ponds on the lower end. Reconstructing Twin Creek into a more natural planform and pattern will present an opportunity for public fishing for wild fish on public land.

E. If the project requires maintenance, what is your time commitment to this project?:

Trout Unlimited has included post project maintenance in Twin Creek reclamation plan. For example, on the Mattie V Creek project, TU and the Lolo NF set up water sprinklers on the project site, fenced the riparian corridor and dedicated manpower to post project weed treatment and soil amendment as required by monitoring. TU has full time staff dedicated to project planning and these maintenance activities, including seasonal field technicians.

F. What was the cause of habitat degradation in the area of this project and how will the project correct the cause?:

There were formerly more than 60 mining claims on Twin Creek. The mining areas have been abandoned by the operators and left in an unreclaimed condition, and there are no records with the Forest Service of active mining claims within the watershed. Due to this past mining activity, Twin Creek has been heavily altered, especially in the lower reaches near its confluence with Ninemile Creek. Problems include impaired habitat, channel straightening, dewatering and a lack of connection with Ninemile Creek. The reclamation project will move large piles of dredge mining tailings, fill in mining cutslopes and settling ponds and reconstruct a new stream channel to connect with mainstem Ninemile Creek.

G. What public benefits will be realized from this project?:

The Twin Creek project is located on public land managed by the US Forest Service and therefore open to public access. The public will benefit from improved fishing for anglers, improved water quality for the community adjacent to Lolo National Forest, improved aesthetics as the creek is restored to a natural state, and an increased likelihood of improving fluvial life history forms of westlope cutthroat trout.

H. Will the project interfere with water or property rights of adjacent landowners? (explain):

No. There are no water rights on Twin Creek or Ninemile Creek in the area.

I. Will the project result in the development of commercial recreational use on the site?: (explain):

No

J. Is this project associated with the reclamation of past mining activity?:

Yes

Each approved project sponsor must enter into a written agreement with the Department specifying terms and duration of the project.

IV. AUTHORIZING STATEMENT

I (we) hereby declare that the information and all statements to this application are true, complete, and accurate to the best of my (our) knowledge and that the project or activity complies with rules of the Future Fisheries Improvement Program.

Applicant Signature:

Date:

Sponsor (if applicable):

***Highlighted boxes will automatically expand.**

**Mail To: Montana Fish, Wildlife & Parks
Habitat Protection Bureau
PO Box 200701
Helena, MT 59620-0701**

Incomplete or late applications will be returned to applicant.

Applications may be rejected if this form is modified.

*****Applications may be submitted at anytime, but must be received by the Future Fisheries Program office in Helena before December 1 and June 1 of each year to be considered for the subsequent funding period.*****

